ROLL NO. _____

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Code: AE76 Subject: WIRELESS AND MOBILE COMMUNICATIONS

AMIETE – ET (NEW SCHEME)

Time: 3 Hours **JUNE 2012** **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Wireless access network unit (WANU) consists of:

(A) Base station transceivers **(B)** Radio controller
(C) Access manager **(D)** all of the above

b. The design process of selecting and allocating channel groups for all cellular base station within a system is called:

(A) Adjacent channel interference **(B)** Frequency planning
(C) Near far affect **(D)** Co- channel interference

c. If the subscriber moves from one cell to other cell within BSC then this type of hand off is called:

(A) Inter-cell-inter BSC handover **(B)** Intra-cell-intra BSC handover
(C) Inter-cell-intra BSC handover **(D)** Inter MSC handover

d. Which technique carries only one phone circuit at a time

(A) FDMA **(B)** CDMA
(C) TDMA **(D)** all of the above

e. Wi-Fi stands for

(A) Wireless frequency **(B)** Wire line fidelity
(C) Wireless function **(D)** Wireless fidelity

f. The IEEE standard for wireless PAN Bluetooth is:

(A) IEEE802.11 **(B)** IEEE802.15
(C) IEEE802.16 **(D)** IEEE802.14

g. Which of these is not a third generation cellular system

(A) UMTS **(B)** 3G PCS
(C) GSM **(D)** IMT -2000

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h. The expression $P_e=Q\ (2E_b/N_0)^{1/2}$ is probability of error for which of following:

(A) QPSK **(B)** DPSK
(C) BPSK **(D)** $\pi/4$ QPSK

i. If the bandwidth of signal is greater than that of channel then it is:

(A) Frequency selective fading **(B)** Fast fading
(C) Slow fading **(D)** Multipath fading

j. Which of these is not a packet radio protocol

(A) Pure aloha **(B)** Slotted aloha
(C) PRMA **(D)** X.25 protocol

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Briefly describe:
(i) Frequency Reuse
(ii) Channel Allocation Schemes
(iii) Interference and system capacity
(iv) Trunking and Grade of service **(4×2=8)**

b. A Hexagonal cell within a four-cell system has a radius of 1.387 km. A total of 60 Channel is used. If load per user is 0.029 Erlangs and λ= 1 call /hr compute for an Erlangs C system that has 5% probability of delayed call: **(8)**
(i) How many users it can support?
(ii) Probability that a call will have to wait more than 10 sec.?
(iii) What is the probability that a call will be delayed for more than 10 sec?

Q.3 a. Describe the various propagation mechanisms which impacts propagation in a mobile communication system. **(8)**

b. Find linear block encoder G if code generator polynomial $g(x)=1+x+x^3$ for a (7,4) code. **(8)**

Q.4 a. If, 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice & control channels. Compute the number of channels available per cell if a system uses:

(i) Four-cell reuse
(ii) Seven- cell reuse
(iii) Twelve- cell reuse

If, 1 MHz is dedicated to control channels, determine distribution of control & voice channels in each cell for each of the three systems. **(8)**

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b. Explain different types of Multiple Radio Access protocol. **(8)**

Q.5 a. Briefly discuss various linear modulation techniques. **(8)**

b. Describe Channel Allocation Strategies and also elaborate Static allocation and Dynamic allocation. **(8)**

Q.6 a. Briefly explain the procedure to setup a call in a GSM network. **(8)**

b. Briefly explain the following terms: **(8)**

(i) Registration
(ii) Handoff parameters & underlying support
(iii) Roaming support
(iv) Multicasting

Q.7 a. Explain GSM architecture in detail. **(8)**

b. Describe forward CDMA channel in case of IS-95. **(8)**

Q.8 a. Briefly describe Wireless Sensor Networks, its characteristics and applications. **(8)**

b. Enumerate the various characteristics of MANET. **(8)**

Q.9 Write short note: **(4×4=16)**

(i) WMAN
(ii) WLAN
(iii) WPAN
(iv) Directional & smart antennas

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